

**REMARKS**

Claims 32-69 are in the application. Claims 32, 36-38, 40, 46, 52, 53, 55, 61-63 have been amended. Claim 39 has been cancelled. The Examiner rejected claims 32-69 as anticipated by *Greenwood* (US 6,763,698). Consideration of the application as amended is respectfully requested.

**CLAIM REJECTIONS UNDER 35 USC § 102**

In rejecting claims 32-69 are rejected under 35 USC 102 (e) as anticipated by *Greenwood* (US 6,763,698). The Examiner stated that,

*Greenwood* discloses transducer 30 responds to the echoes by producing an output signal proportional to the echo amplitude that is amplified by receiver 60, digitized by digitizer 70 and passed to computer 80. Computer 80 includes programming instructions encoded . . . to select a peak echo amplitude for the series of echoes and to determine the average decay rate of the peak echo amplitude with increasing echo number in the echo series.

Independent claims 32, 46, 61, 62, 63 and 69 have been amended to include the limitation of "subdividing each return pulse into a plurality of time windows and integrating the energy in each time window over the duration of the pulse to obtain the energy in the pulse." This limitation is supported by the summary of the invention for the present application, on page 6, ll. 10-19. This limitation is not taught or suggested by *Greenwood*, thus the 102(e) rejection is improper and should be withdrawn.

## TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). >"When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) (claim to a system for setting a computer clock to an offset time to address the Year 2000 (Y2K) problem, applicable to records with year date data in "at least one of two-digit, three-digit, or four-digit" representations, was held anticipated by a system that offsets year dates in only two-digit formats). See also MPEP § 2131.02.< "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim.

*Greenwood* teaches the use of peak amplitude to determine a property of a fluid.

The present application invention discusses the problem with using peak amplitudes as used in *Greenwood*, as follows:

The present invention is more accurate than prior attempts to determine density of unknown fluids such as that described U.S. patent number 5,741,962 (the '962 patent). In the '962 patent, reflection coefficients and the corresponding fluid density are calculated from peak-to-peak amplitudes (FIGS. 4A and 4B of the '962 patent), which can be very unreliable and prone to aliasing, sampling, and other experimental measurement errors. FIG. 11 shows the poor results of applying the method of '962 patent to the lab verification experiment of the present invention. It plots the logarithm of the square of the maximum amplitude swing within once cycle against pulse echo number. Now, instead of the high coefficients of determination ( $R^2 > 0.99$  in FIG. 5) obtained by the pulse-integration method of the present invention, the coefficients of determination vary from  $R^2 = 0.65$  to  $R^2 = 0.73$  and the points do not lie close to the best fit lines 1102, 1104, and 1106. The reason is that the '962 patent, like '383 patent, describes using an idealized signal for illustration. Only if the pulse shape remained completely unchanged from pulse-to-pulse (or from echo-to-echo of a single pulse) would the square of the peak-to-peak amplitude remain proportional to the integrated peak energy. However, from the experimental data in Figures 2-4 of this

invention it is clear that successive pulse echoes are not simply rescaled copies of the previous pulse but that they undergo distortion, which causes the square of the peak amplitude swing to be an unreliable indicator of total pulse energy. The present invention estimates the energy under an entire pulse rather than relying on a single transient peak amplitude. Thus the present invention provides a more accurate method and apparatus than relying on a transient peak amplitude as in the '962 patent. (p. 17, l. 9 – p. 18, l. 5)

Thus, *Greenwood* does not recognize or address the problem of inaccuracy associated with the peak amplitude method. Moreover, *Greenwood* does not teach the limitation of “subdividing each return pulse into a plurality of time windows and integrating the energy in each time window over the duration of the pulse to obtain the energy in the pulse.” Thus, the 102(e) rejection is improper and should be withdrawn. Applicant requests that the Examiner allow claims 32-69 to issue.

The Commissioner is hereby authorized to charge any fee and credit any overpayment associated with this response to Deposit Account No. 02-0429(584-30656-US).

Respectfully submitted,



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